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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,021	10/22/2003	Takeshi Kijima	117581	4018
25944	7590	01/09/2006	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			XU, LING X	
			ART UNIT	PAPER NUMBER
			1775	
DATE MAILED: 01/09/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Period for Reply

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,8,9,24,25 and 27-30 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,8,9,24,25 and 27-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicants' amendments filed on 2/26/2001 have been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Pintilie et al.

("Enhancement of the Photoconductive Properties of PBS Films Deposited on Ferroelectric Substrates", *Materials Science and Engineering* B44 (1997) 292-296)

Pintilie discloses a ferroelectric film having a formula $\text{Pb}_{0.98}\text{La}_{0.02}(\text{Zr}_{0.585}\text{Ti}_{0.315}\text{Nb}_{0.1})\text{O}_3$, which meets the limitations of claims 1-2.

Pintilie also discloses that the ferroelectric film can be deposited on the semiconductor substrate to obtain non-volatile and analogue memories (page 292).

3. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Vogel (US 3,681,226).

Vogel discloses a ferroelectric film having a formula $\text{Pb}_{0.92}\text{Bi}_{0.07}\text{La}_{0.01}(\text{Fe}_{0.405}\text{Nb}_{0.325}\text{Zr}_{0.27})\text{O}_3$, which meets the limitations of claims 1-2.

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Vogel also discloses that the ferroelectric film can be used in logic and memory device (col. 1, lines 50-70).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 24-25 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramesh et al. (US 2002/0009612) in view of Vogel.

Ramesh discloses a ferroelectric film may be used to form piezoelectric actuators or ferroelectric memory cells (page 1, embodiment [0008]). It is well known in the art that the ferroelectric memory cell inherently comprises at least a substrate, a transistor and a ferroelectric capacitor and the piezoelectric actuator inherently comprises at least a substrate and a piezoelectric element having a ferroelectric film.

Ramesh does not disclose that the ferroelectric film having the formula as recited in claims 1-2.

Vogel teaches a ferroelectric film having a formula $\text{Pb}_{0.92}\text{Bi}_{0.07}\text{La}_{0.01}(\text{Fe}_{0.405}\text{Nb}_{0.325}\text{Zr}_{0.27})\text{O}_3$, which meets the limitations of claims 1-2.

Vogel also teaches that the disclosed ferroelectric film is a thin film with improved quality and performance (col. 3, lines 10-20).

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Therefore, it would have been obvious to one of ordinary skill in the art to use the ferroelectric film taught by Vogel in order to obtain a ferroelectric thin film with improved quality and performance in Ramesh's piezoelectric actuator or ferroelectric memory cell.

5. Claims 1-2, 24-25 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi (US 5,579,258) in view of Vogel.

Adachi discloses a ferroelectric substance for forming a ferroelectric thin (col. 1, lines 10-20).

Adachi also discloses a ferroelectric memory cell comprising a substrate, a transistor and a ferroelectric capacitor having a ferroelectric film (col. 1, lines 40-60).

Adachi also discloses that the ferroelectric thin film has great piezoelectric effect and can be used for an actuator (col. 1, lines 5-10).

Adachi does not disclose that the ferroelectric film having the formula as recited in claims 1-2.

Vogel teaches a ferroelectric film having a formula $\text{Pb}_{0.92}\text{Bi}_{0.07}\text{La}_{0.01}(\text{Fe}_{0.405}\text{Nb}_{0.325}\text{Zr}_{0.27})\text{O}_3$, which meets the limitations of claims 1-2.

Vogel also teaches that the disclosed ferroelectric film is a thin film with improved quality and performance (col. 3, lines 10-20).

Therefore, it would have been obvious to one of ordinary skill in the art to use the ferroelectric film taught by Vogel in order to obtain a ferroelectric thin film with improved quality and performance in Adachi's piezoelectric element (actuator) or ferroelectric memory cells.

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6. Claims 8-9 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vogel, as applied to claims 1-2 above, and further in view of Hase et al. (US 5,279,996).

As stated above, Vogel discloses the same ferroelectric film as recited in claims 1-2.

Vogel does not disclose the ferroelectric film comprising Si, Ge or Si and Ge as recited in claims 8-9 and 27-28.

Hase teaches that a piezoelectric ceramic composition mainly composed of lead titanate zirconate (col. 2, lines 5-20).

Hase also teaches that a small amount of at least one of Si and Ge added to the piezoelectric composition can improve the mechanical strength of the composition (col. 2, lines 5-20).

Therefore, it would have been obvious to one of ordinary skill in the art to add small amount of Si as taught by Hase into the ferroelectric film composition in order to improve the mechanical strength of the composition.

Although Hase does not specify the mol% of the Si, Ge or Si and Ge in the composition as recited in claims 9 and 28, differences in concentration of the elements present in the composition will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235(CCPA 1955)

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Therefore, it would have been obvious to one of ordinary skill in the art to discover the optimum or workable mole% range of the Si, Ge or Si and Ge present in the composition by routine experimentation absent of showing that such range is critical.

7. Claims 8-9 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pintilie et al., as applied to claims 1-2 above, and further in view of Hase et al. (US 5,279,996).

As stated above, Pintilie discloses the same ferroelectric film as recited in claims 1-2.

Pintilie does not disclose the ferroelectric film comprising Si, Ge or Si and Ge as recited in claims 8-9 and 27-28.

Hase teaches that a piezoelectric ceramic composition mainly composed of lead titanate zirconate (col. 2, lines 5-20).

Hase also teaches that a small amount of at least one of Si and Ge added to the piezoelectric composition can improve the mechanical strength of the composition (col. 2, lines 5-20).

Therefore, it would have been obvious to one of ordinary skill in the art to add small amount of Si as taught by Hase into the ferroelectric film composition in order to improve the mechanical strength of the composition.

Although Hase does not specify the mol% of the Si, Ge or Si and Ge in the composition as recited in claims 9 and 28, differences in concentration of the elements present in the composition will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the

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optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235(CCPA 1955)

Therefore, it would have been obvious to one of ordinary skill in the art to discover the optimum or workable mole% range of the Si, Ge or Si and Ge present in the composition by routine experimentation absent of showing that such range is critical.

Response to Arguments

8. Applicant's arguments filed on 11/18/2005 have been considered but are moot in view of the new ground(s) of rejection.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling X. Xu whose telephone number is 571-272-1546. The examiner can normally be reached on 8:00 - 4:30 Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah D. Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ling X. Xu
Primary Examiner
Art Unit 1775